REPORT on an INVESTIGATION of the lower RIVER BOVEY.

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I visited the lower River Bovey on the afternoons of 28th and 29th September and observed parts of the River Wray and the middle River Bovey in company with one of the Devon River Board's bailiffs on the morning of 29th September, 1959. I was greatly assisted by Mr. Baily Everard who accompanied me along the river bank and I heard something of the earlier history of the Association's fishing in the River from Mr. Trevor. (Hope).

Procedure.

On 28th September, I walked most of the way alongside the river from Little Bovey bridge to Bovey Tracey bridge and collected faunal samples at intervals and also a sample from the small stream entering on the west side. Later that evening I visited Pullabrook bridge and took a sample from the river just below it. On 29th September, I walked from Twinyeo Farm bridge down to the junction of the Bovey with the River Teign and collected three samples.

The samples were collected using a hand-net which was pushed through the substratum and through clumps of weed. Part of the substratum and weed was put unsorted into a polythene jar with a little water and preserved by adding a little alcohol. I also picked up large stones and removed animals from them with forceps and put them into the jars. Each jar was numbered to show where it came from and the positions of the sampling stations are indicated on the sketch map (Appendix I, page 13). In Oxford, I sorted out the animals from each of the samples by washing them with concentrated Epsom salt solution (the majority of animals float to the surface and the plant debris and stones sink) and then sieving them to recover snails, caddis cases, etc. The animals were then identified as far as possible and their numbers recorded either exactly or estimated as "very abundant"(V), "abundant"(A), "frequent"(F) or "present"(P).

I noted the sort of place in the river where each sample was taken but each one, as far as possible, included some gravel and some weed as well as the specimens from the large stones. I tried to cover all the possible habitats and I think that I

collected specimens of all invertebrate animals which were present in reasonable numbers and would form useful food for trout - except for those mayflies and caddis flies which would be represented only as eggs at this time of year.

The complete list of animals collected is given in Appendix II (page 14). In Appendix III (page 15), the collections are analysed into the main groups of food organisms and the stations are arranged in order from up- to down-stream. There is a very brief description of each station and for each group of food organisms I have given the number of individuals collected and the number of species to which they belonged.

Information about the lower River Bovey (obtained from Mr. Michelmore, Mr. Trevor and Mr. Baily Everard).

There is no reservoir or other means of impounding water on the River and there are no industries which are likely to produce effluents poisonous or detrimental to fish. There have been lead and barytes mines in the catchment area but none is working at present. It is possible that some may have been used in the War and the buildings of one have been used in recent years for another industry (information from Mr. Wilson, D.R.B.). There was an incident at Bovey Tracey, probably in the '30s, when lead storage batteries were either emptied or thrown into the River there and there was a considerable fish mortality.

The brown trout fishing used to be very good at the turn of the century - there were large numbers of little fish in all the Dartmoor rivers. In the Bovey, it continued to be quite good until the early '30s (Mr. Trevor) or until 1939 (Mr. Baily Everard) but since the War it has been disappointing. There appear to be few small trout and 4" and 8" trout planted in October seem to disappear. I am indebted to Major General Pargiter for his statistics of his own catches during the last 11 years. I understand that he fishes mainly between Jews' Bridge and the junction with the River Teign (covered by my samples 14, 15 and 16); his figures are given in Appendix IV.

On average, it has taken Major General Pargiter about five hours fishing for each brown trout of more than 8 inches - and this seems disappointing. He caught more than 50 8" fish in 1949, 1950 and 1954 (the figure for 1959 would be 46 for 208 hours, assuming a catch proportional to time spent); and his lowest catches were in 1956, 1955 and 1957 respectively. These figures suggest that there may have been some deterioration between 1950 and 1955 but that there has been a slight recovery towards the 1950 condition - but that this was not as good as it should have been.

Mr. Baily Everard told me that there is usually a hatch of grannom in March (and I collected some larvae of this caddis) but there are no obvious hatches of fly later in the year. Mr. Trevor reported that there had been an attempt to introduce Gammarus (freshwater shrimp) in, probably, 1954 but it had been unsuccessful. He knew no details of how this attempt had been carried out.

Mr. Michelmore, in his first letter to me, implied that sewage effluent containing detergent might be spoiling the river but analyses made in August 1958 for the Devon River Board showed that the water was "very clean" both at Becky Bridge and at Little Bovey bridge. These analyses are given in Appendix V (page 17). I had a good look at the sewage works outfall below Bovey Tracey and the indications were that it must be of good quality as regards organic matter in solution.

Observations on the River Bovey.

Plants.

When I visited the river, its level was very low but there was quite a good flow of water. In all the shallow parts (up to about 18" deep) the stones were covered with encrusting algae except where the stream was passing through a wood. In a summer with less sunshine, there would probably be much less of this algal growth but it is a source of food for some of the insect larvae and for the limpet and for some snails. The water moss (Fontinalis antipyretica) was fairly common in fast, shallow stretches. The most common higher plant in the water was starwort (Callitriche)

and I saw only one clump of water cress (Nasturtium officinale) and that was a short distance below Bovey Tracey bridge (station 11). Starwort seemed to be more abundant below the sewage works outfall than above it - i.e. some was present in all suitable places between stations 8 and 16 but we had to search to find it above station 9 and were successful in finding it at station 11.

I saw the River Bovey from Clapper bridge and just above Hunter's bridge and there were abundant and healthy clumps of starwort there. I also found plenty of starwort in the River Wray near Moretonhampstead station.

There are plenty of trees alongside the Association's water - perhaps too many for good fishing in parts. These trees are important in providing food for trout in summer months when aquatic forms may be scarce because the aerial adults have emerged. In many waters, trout feed almost entirely on terrestrial insects during July and the abundance of trees near the River Bovey should mean that there is plenty of food available for them at that time. Where there are too many trees, however, the shade may discourage water plants and so reduce the amount of food for the trout in the water.

Animals.

I was wearing polaroid glasses and kept on the look-out for trout in the water. We saw a good number of peal in various pools and I also saw some smaller fish which must have been resident brown trout. In some of the larger pools there were up to a dozen fish which seemed to be 6" to 10" long but I saw very few fish smaller than this and the total numbers I observed were fewer than I would expect to see in a good fishing river of this type. I caught some bullheads (or Miller's thumbs, Cottus gobio) and one small eel and I saw a few minnows.

The list of invertebrate animals collected is given in Appendix II and analysed in groups in Appendix III. Most of the way down the river, the larger stones carried a few limpets (Ancylastrum fluviatile), specimens of reed smut larvae and pupae (Simulium) and the stony cases of the caddises Glossosoma, Rhyacophila and Hydropsyche.

The latter, the grey sedge or flag, appeared to be the most abundant caddis and there were large and small invividuals indicating at least two generations. They should hatch in May and are reckoned to give good fishing in Ireland. While inside their cases, they are not available to the trout as food. The reed smut larvae and pupae are said to be good food for small trout (in their first year) and are taken by older trout when they are "hatching" into adult gnats - mainly in May but usually in small numbers through the summer months, especially in hot weather. The limpets are not eaten very much by trout but their presence shows that the water is relatively clean and unpolluted.

Chironomid larvae (bbodworms) were common along most of the river but were particularly large and very abundant just below the sewage works outfall. Their presence there indicates a certain amount of organic pollution but the rest of the fauna at station 8, a short distance below, shows that this is not at all serious. Bloodworms burrow in mud or in tubes among vegetation so they are not available to trout as food until they pupate and then hatch.

Stoneflies were rather uncommon, only one species, Amphinemoura, being present in large numbers (at two stations, 8 and 10). The most valuable fly from the fisherman's point of view is Perlodes, of which I collected only two specimens.

The number of mayflies collected was surprisingly small and included two species only. Ecdyonurus lives on stones and is eaten by trout as a nymph. It is said to hatch in the afternoon by clambering up projecting boulders and so provides no "hatch" for the fisherman. Baetis is small and lives among vegetation and is not usually of great use as trout food.

Beetles and flies other than those discussed above were caught in small numbers and are of no particular significance.

Snails may form an important part of a trout diet and I found only two species in the River Bovey. The more numerous was Hydrobia, which often crawls over stones. The other, Limnaea peregra, is sometimes considered to be an indicator species

for where it is found in numbers in non-calcareous waters, trout usually grow well. It lives among weeds and I found it in numbers at two stations (8 and 4) between the sewage works outfall and Little Bovey bridge. Its presence suggests that the Bovey is potentially a good trout river.

One group of organisms are of interest because of their complete absence from the lower Bovey - the larger Crustacea. Of these, the freshwater shrimp, Gammarus, is an excellent trout food and some species live happily in soft, acid waters while Asellus, the water hog-louse, is widely distributed in England and tolerant of polluted conditions. It lives among decaying leaves and vegetation. At station Y, near Moretonhampstead station, I examined one clump of starwort and it was crawling with shrimps (Gammarus) of all sizes - so the upper part of the River Wray is well stocked with Gammarus and I think it is surprising that there is none lower down.

I looked at two small streams which flow (ultimately) into the River Bovey. Kelly Brook, at Lustleigh, is tiny, with stones, boulders and dead leaves. The presence of the flatworm, Polycelis, and the limpet, Ancylastrum, indicate that the water is clear of gross pollution but Simulium and Chironomids dominated the fauna and there were no stoneflies or Gammarus. The little brook entering from the west above Little Bovey bridge was in deep shade with a sandy bottom where I examined it and the collected fauna is quite typical of those conditions except that I would expect to find Asellus among the leaf debris.

Comparison of the River Bovey with other similar rivers.

The Bovey is a small river, rising from moorland and flowing mainly over non-calcareous rocks with fairly steep gradients for much of its course. It is unusual among West Country rivers in that part (of the River Wray) rises from springs in calcareous rocks so that the water of the lower River is nearly neutral (not acid) and there was still reasonable flow after a long, dry spell.

There are few studies of other West Country rivers but I have a brief account of the Walla Brook, a tributary of the East Dart. This is really equivalent

to the moorland part of the River Bovey and it contains many small trout. Mrs. Horton, of Exeter University, observed the Brook for three years and concluded that the insects which were of most value as trout food were a caddis, Chaetopteryx, two stoneflies, Protonemoura and Isoperla and a mayfly, Baetis rhodani. The latter was present in the Bovey close to its confluence with the Teign; the others were not caught but Amphinemoura is close to Protonemoura in size and habits.

Mrs. Horton, in her more detailed study, caught a larger number of species of insects than I did but most of the species I found in the Bovey were also in Walla Brook. I think there is a real difference between the two faunas and that Walla Brook contains a greater variety of mayflies and stoneflies and perhaps of caddis-flies than the Bovey. Walla Brook also contains dragonflies and the alder fly and I would have expected to find them in the Bovey and was surprised not to do so.

There is no reference in Mrs. Horton's report to crustaceans and I think this means that Gammarus is not present there; I believe that the water is markedly ld. Mrs. Horton concluded that the poor growth of the trout was the result of too large a fish population relying on a poor bottom fauna, the latter due to the acidity of the water. Since little trout are very abundant, conditions are clearly different from those in the Lower Bovey.

There are rivers similar to the West Country rivers in Wales and those of Cardiganshire have been investigated, first by Dr. Kathleen Carpenter and later by Dr. Erichsen Jones and his collaborators. The special interest of these rivers is that some are highly polluted with lead and zinc; closure of mines has led to gradual recovery in some and the changes in fauna have been recorded. Most of these are as long or longer than the River Bovey and some of the papers record separately the faunas of the moorland and lowland reaches so that direct comparison with the Lower Bovey is possible.

The River Bovey, with pH 6.8 and calcium 4.8 ppm, is considered to be virtually unpolluted and its lower parts sound comparable with the Lower Bovey.

The snail, Limnaea pereger, is common and Gammarus zaddachi is very abundant. Of mayflies, Rithrogena, Ephemerella and Chloeon are frequent or abundant while Ecdyonurus and Baetis are present. Stoneflies are not abundant and Leuctra and Nemoura are the commonest forms. The list of caddis flies is very like that for the Bovey but the most abundant were Glossosoma and Anabolia, followed by Halesus, Hydropsyche and Limnophilus. Minnows and sticklebacks were abundant and eels were frequent. Brown trout are plentiful all along the river and sea trout and salmon are abundant.

The Dovey is liable to violent floods and vegetation is abundant only in the lower reaches where the gradient is small. Erichsen Jones comments that mayflies are much less numerous than he expected and he is surprised by the absence of one dragonfly - but two others are quite numerous.

The Teifi is another unpolluted river (or perhaps with mild organic pollution and some past metallic pollution), its pH is 6.8 and the water is very soft; it is subject to heavy floods. The minnow is the most abundant fish but there is good brown trout, sea trout and salmon fishing. Gammarus and Asellus are abundant, so are the snails Limnaea and Hydrobia and the pea mussel Pisidium. Isoperla and Isoptervx are abundant stoneflies. Among mayflies, Ephemerella, Coenis and Baetis are abundant; the abundant caddis flies are Anabolia, Sericostoma, Lepidostoma, Mystacides, Hydropsyche and Philopotamus; four species of dragonfly were collected. Thus there are differences between the most common species in the lower Dovey and lower Teifi - but in both there are abundant crustaceans and abundant Limnaea pereger.

As a contrast we can take the lower River Rheidol. This was so badly polluted with lead that there were practically no animals living in it but all the mines had ceased working by 1920 and there has been a progressive recovery with increase in quantity and variety of fauna. A survey in 1931/2 showed trout, eels and sticklebacks to be present. The larger crustacea were absent; Limnaea was fairly numerous in one collection; Isoptervx, Leuctra and Perlodes were fairly numerous stoneflies; Baetis,

Ecdyonurus and Siphlonurus were abundant mayflies; Halesus and Anabolia were abundant and ~~Polycentropus~~ and Limnophilus were fairly numerous caddises. The pH is 6.6 to 6.8 and the lead concentration at that time was never more than 1 part per million. In 1919 to 1921, there were only 14 species of animals recorded (no caddises, 2 stoneflies, 1 mayfly, the alderfly, 1 dragonfly, no molluscs and no larger crustacea) but in 1922/23 there were 29 species and these included 8 caddises and a second mayfly. In 1931/32, 104 species were recorded (including 17 caddises, 4 mayflies, 8 stoneflies, 3 dragonflies and 4 molluscs). Erichsen Jones experimented on lead tolerance with some aquatic animals and found that the stickleback, the limpet Ancylastrum and the snail Limnaea peregor were most susceptible. The River Ystwyth has also been investigated and still suffers from some zinc pollution. In 1940 it held 58 species of animals and when compared with the similar but unpolluted Dovey lacked 84 species found in the latter river. These included fishes, amphibia, molluscs and crustaceans ose absence from the Ystwyth was almost certainly the result of the metallic pollution; some of the other species are probably absent still because the river bed of the Ystwyth is very unstable and almost devoid of plants. By 1953, trout were present but molluscs and crustaceans were absent and caddises were rare.

In general character the River Bovey seems to have much in common with the Rivers Dovey and Teifi; the latter are good trout rivers and there seems to be no obvious reason why the Bovey should not be good, too. The chief contrast between them is the absence of Gammarus and Asellus in the Bovey and the greater rarity of Limnaea. The relative abundance of insect species differs in the two Welsh rivers but mayflies are more numerous in species and abundance than in the Bovey even though Erichsen Jones expected more in the Dovey than he found. Ephemerella occurs as a nymph for a few weeks only and it may well be abundant in the Bovey - it would be in the egg stage in September and therefore very inconspicuous. The absence of dragonflies from the Bovey is odd.

I wondered whether there was metallic pollution in the Bovey but the presence of the limpet Ancylastrum and of the reed smut Simulium in numbers makes this

very unlikely. It is possible that there is some pollution after heavy rain. The summer has been very dry so that seepage from old tips would be at a minimum - it is just possible that all the limpets and reed smuts are this year's brood and would not have been present after a wet summer. It is also possible that the river is in the process of recovering from pollution, say, during the War but judging from the observations on the Rheidol, recovery should be nearly complete by now.

Conclusions.

The fauna of the Lower Bovey is not as rich as I expected it to be. The most common invertebrate animals were limpets, reed smut larvae and three caddis larvae. Stoneflies were rather uncommon and I collected only two species of mayfly and these were most common near the confluence with the River Teign. The useful snail Limnaea peregeg was numerous only at two stations and there were no shrimps or water hog-louse.

There is no indication that effluent from the sewage disposal works at Bovey Tracey is having an adverse effect on the river.

There is no evidence that the river has suffered from metallic pollution during the summer but there is a remote possibility that there may be pollution after heavy and prolonged rain - or that there has been such pollution in the past.

Major General Pargiter's records suggest that there may have been deterioration in the fishing between 1950 and 1955 and perhaps some recovery since - but it is clear that the fishing is not as good as it probably should be.

When compared with Welsh rivers of similar character where the fishing is good, the fauna of the lower Bovey is poorer in species and variety, the most conspicuous differences being in the crustaceans, molluscs, mayflies and stoneflies. Of these, the two former are likely to be the most valuable as food for the trout but the latter might provide better sport by increasing the number of hatches during the season.

The relatively poor faunas of the Walla Brook, Dartmoor, and some of the Welsh rivers is ascribed to their "flashiness" and the shifting of the bottom stones by

sudden floods. However, some of these rivers are good trout rivers in spite of this liability to flood and must support enough animals to provide food for the trout - so the fact that it floods in this way cannot account for poor fishing in the Bovey.

Recommendations.

Although I can give no definite reason for deterioration in the food supply, it seems clear that the present invertebrate fauna of the Lower Bovey is not as rich in numbers or variety as I should expect so that better fishing in the past was probably associated with a better food supply. So the obvious thing to do is to try to improve the food supply and the following are possible ways of doing this :-

(1). To encourage the growth of weed in the water and especially in quieter reaches where there is likely to be less disturbance of the bottom in floods. I do not remember seeing many such places and it is clear that the starwort, Callitriche, grows well in midstream so it is well worth trying to encourage it everywhere except where the water is very broken. Cutting back the trees on the bank to let in more sunlight should help the water plants. I suggest that the easiest way to propagate the starwort is to take large, well-established clumps and remove part, attached to stones, and deposit these somewhere else. It would be worthwhile to try to encourage such plants as water-cress and brooklime (Veronica beccabunga) to grow near the edge as they can survive a certain amount of change in level.

(2). To try again to introduce the shrimp Gammarus which would be a very valuable food organism if it could be established. I suggest visiting the upper part of the River Wray and collecting clumps of starwort attached to stones and harbouring shrimps and transporting these to the lower Bovey. They should be put in as quiet water as you can find, near established plants, and I suggest distributing them over most of the length of your water. If they can survive until spring of 1961 they will probably start to spread gradually and they may be successful from earlier than that.

(3). To encourage the spread of the snail Limnaea peregor. This will be achieved by spreading water weeds because it lives among them.

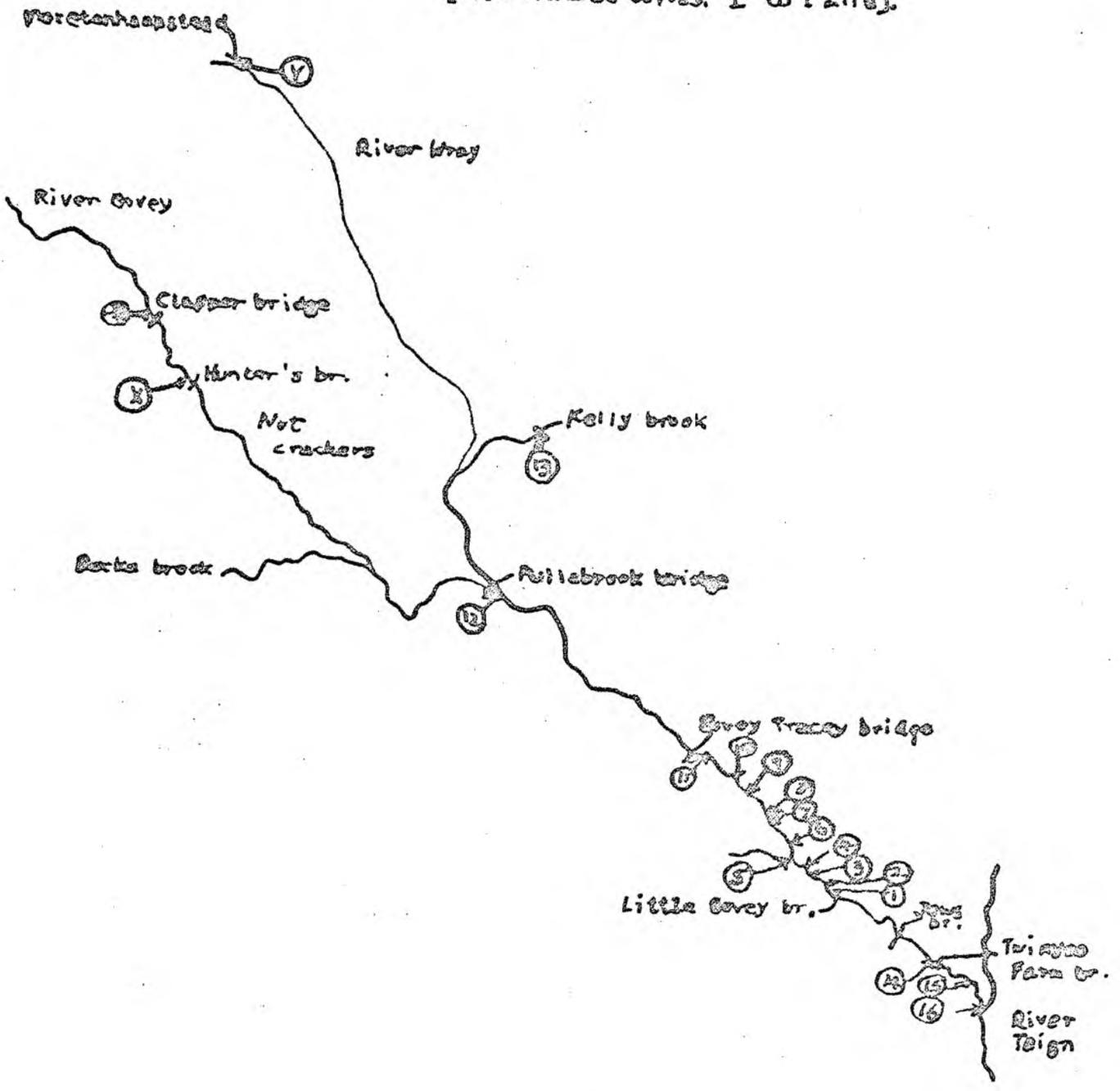
With regard to stocking with trout, I suggest that you either do not stock at all this year or stock with a small number of 8" fish put in mainly at the upper end of your water. They are likely to drift downstream in search of good feeding and this will give the maximum probability that they will stay in your water, gradually distributing themselves over the length of it.

As I think that there is a small possibility that intermittent metallic pollution may be the cause of the poor fauna, you may want to pursue this further. If so, I can put you in touch with a firm of analysts in Reading who will send you containers for the water. The most probable time for finding metal ions would be after heavy rain in the valley had caused a flood which was beginning to subside. I doubt whether there would be a positive result. One indication that this sort of pollution occurs would be the disappearance of limpets from stones in the stream so it would be worth looking for these at intervals. There is likely to be a fall in their numbers during the winter anyway but a very great reduction would indicate some catastrophe.

There seems to be no a priori reason why Gammarus should not flourish in the lower Bovey but if you like I can experiment with some here. If you send me about a gallon of river water (in a clean polythene container) and a tin of weed plus shrimps from the upper Wray, I can test them in tanks and compare the survival in Thames water and Bovey water. If they survived, it would mean that there was nothing deleterious about the water chemistry so that there would be every hope of them being established in the Lower Bovey.

I hope you will keep me informed about what you do and how the fishing varies because it is only from such records that I can build up experience from which to give useful advice.

Appendix I. Sketch map to show positions of sampling stations.
[From Ordnance Survey. 1" to 1 mile].



Appendix II. List of animals collected at the various stations.

Station number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Polycelis nigra (flatworms)	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
Lumbriculids (annelid worms)	-	-	-	-	12	r	-	-	-	-	-	-	-	-	-	-
Piscicola geometra (fish leech)	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-
water mites	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Mollusca																
Ancylastrum fluviatile (limpet)	4	2	1	-	-	-	F	2	-	-	F	-	1	F	2	1
Hydrobia jenkinsi (snail)	4	-	F	3	-	-	-	1	-	7	8	-	-	F	11	17
Limnaea pereger (snail)	3	1	1	16	-	1	-	20	-	-	2	-	-	-	1	-
Ephemeroptera (mayfly larvae)																
Ecdyonurus (Late March brown)	1	-	-	-	-	-	-	-	-	-	-	3	-	1	1	-
Baetis (olive)	-	-	-	-	-	-	-	-	-	1	-	-	-	1	6	24
Plecoptera (stonefly larvae)																
Leuctra fusca (needlefly)	8	2	5	9	-	1	1	-	-	-	-	-	-	4	2	1
Leuctra geniculata (willowfly)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphinemoura sulcicollis	-	-	10	1	-	-	8	40	-	40	2	1	-	2	1	2
Perlodes microcephala (mortoni)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Trichoptera (caddis larvae)																
Limnophilus	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Brachycentrus subnubilus (grannom)	5	-	-	-	-	-	-	1	-	-	-	1	-	6	8	4
Silo pallipes	5	1	-	-	-	1	-	-	1	-	2	1	-	-	2	-
Sericostoma personatum (Halford's Welshman's button)	2	-	-	2	-	-	-	-	1	-	5	3	1	-	-	-
Hydropsyche instabilis - large	1	1	1	-	1	1	2	3	-	2	-	2	-	7	6	2
(grey sedge/flag) - small	-	19	6	-	-	3	12	16	-	3	1	3	1	4	13	-
Polycentropus flavomaculatus	1	-	-	1	-	3	-	-	-	1	1	-	-	1	-	-
Rhyacophila dorsalis (brown sedge)	-	-	1	-	2	2	3	3	5	-	-	-	-	-	1	-
Glossosoma vernale	-	23	3	-	-	13	-	-	-	7	1	-	-	4	26	4
Mystacides nigra (silverhorn)	-	-	-	8	-	3	-	-	-	-	-	-	-	-	-	-
Coleoptera (beetles)																
Ilybius (I), Haliplid (H) and/Gyrinu (G) larvae	16	H1	-	G1	H1	-	-	-	-	-	-	-	-	-	-	-
Helmis maugei larvae	3	1	-	1	-	1	-	-	-	-	1	-	-	-	1	6
Limnius larvae	4	1	-	-	-	-	-	-	-	-	1	-	-	-	1	1
Helichus (H) and Latelmis (L) adults	H1	-	-	-	-	-	-	-	-	-	-	-	-	-	L1	-
Diptera (two-winged flies)																
Chironomid larvae (bloodworms)	50	40	17	40	-	16	3	42	V	5	5	-	10	6	50	3
Simulium (reed smut) larvae, pupae	P	F	F	P	-	F	F	P	-	P	P	P	A	F	F	F
Culicoides (C), Dixa(D), Limnophora(L)	-	-	-	-	C1	-	-	L1	-	-	L1	-	D1	-	-	-
Tipula sp. larvae (cranefly)	2	-	1	-	4	-	-	-	-	-	-	-	-	-	-	-
Atherix larvae	-	-	2	1	-	-	-	1	-	-	4	1	-	-	1	-
Tabanid (T) and Tanypus (C) larvae	T1	-	-	-	C2	-	-	-	-	-	-	-	C2	-	-	-
Fishes																
Cottus gobio (bullhead)	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-
Anguilla anguilla (eel snigs)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-

Appendix III. Analysis of fauna collected with stations arranged in order downstream.

Description of station	Snail	Plec.	Trich.	Ephem.	Sim.	Chir.	Others
Kelly brook, Lustleigh.							
13 - stones, leaf debris, sun	-	-	2(2)	-	A	10	Polycelis, Anc. Dixa, Tanypus.
Bovey, Pullabrook bridge.							
12 - stones, shade	-	-	10(1)	3	P	-	Atherix
Bovey, between Bovey Tracey bridge and sewage works outfall.							
11 - shallow, weed, sun	10(2)	2	10(5)	-	P	< 5	Atherix, Limnophora Coleoptera (2/2) Anc
10 - pool, moss, shade	7(1)	40	15(5)	1	P	5	Coleoptera (1) leech
Bovey, by sewage works outfall.							
9 - edge of stream, mud, shade	-	-	7(3)	-	-	V	-
Between sewage outfall and small stream (west bank).							
8 - shallow, weeds, sunny	21(2)	40	23(3)	-	P	42	Anc. Atherix, Limnoph
7 - top of pool, weeds, sun	-	9(2)	17(2)	-	F	3	Anc.
6 - shallow, weeds, shade	1	1	25(6)	-	F	16	Coleoptera (1), mite
Small stream							
5 - leaf debris, sand, shade	-	-	2(2)	-	-	-	Lumb., Tipulids, Tanypus, Culicoides.
Bovey, between entry of stream and Little Bovey bridge.							
4 - top of pool, weeds, sun	19(2)	10(2)	12(4)	-	P	40	Atherix, leech Coleoptera (2/2)
3 - pool, weeds, shade	F(2)	15(2)	11(3)	-	F	17	Anc. Atherix, Tipulid Coleoptera (1)
2 - riffle, weeds, sun	1	3(2)	44(3)	-	F	40	Anc. Coleopt. (2/2)
1 - shallow, weeds, sun	7(2)	9(2)	14(5)	1	P	50	Anc. Tipul. Tabanid Coleoptera (15/5)
Bovey, between Twinyeo Farm bridge and junction with Teign.							
14 - shallow pool, sun, weeds	F	6(2)	22(4)	2(2)	F	6	Anc. mite
15 - shallow pool, weeds, sun	12(2)	3(2)	56(5)	7(2)	F	50	Anc. Atherix Col. (5/
16 - fast stream, weeds, shade	17	4(3)	10(3)	24(1)	F	3	Anc. Coleopt. (7/2).

The numbers are the specimens collected except where these were large (e.g. for Hydrobia and for Chironomids at some stations) and for Simulium whose abundance was estimated in the field.
P - present, F - frequent, A - abundant, V - very abundant.
The numbers in brackets are the number of different species in the category where more than one species was found, except that all Chironomids are grouped together.

Snail - Hydrobia and Limnaea, Anc. is Ancylastrum (limpet) under others.
Plec. - all stonefly larvae.
Trich. - all caddis larvae
Coleoptera - all beetles and larvae.
Ephem. - all mayfly larvae.
Sim. - Simulium (reed smut) larvae and pupae.
Chiro - all chironomid larvae. red green or pale

Appendix IV. Record of brown trout caught by Maj.-Gen. R.B. Parriter in lower R. Bovey.

Approximate rod-hours - 208, except for 1959 when it was 95.

Year	8" to 10"	10" to 12"	12" and over	Total over 8"	Under 8"(put back).
1949	49	9	1	59	no record
1950	48	3	1	52	"
1951	36	2	1	39	"
1952	42	4	-	46	"
1953	34	8	2	44	"
1954	53	7	-	60	"
1955	31	3	-	34	"
1956	31	2	-	33	"
1957	32	5	-	37	110
1958	32	10	2	44	89
1959	17	4	-	21	62

Appendix V. Water Analyses (from Public Analysts' Laboratory, Exeter.)

(1). Water collected on 28th August, 1958, at 9.50 a.m. and 10.50 a.m.

	Becky Bridge	Little Bovey Bridge.
	(all figures are parts per million)	
Alkalinity (equivalent of anhydrous sodium carbonate)	13.5	13.5
pH (neutral is 7)	6.9	6.9
Chlorine as chlorides	14.0	14.0
Suspended solids (dried at 105° C)	0.4	0.5
Loss on ignition of suspended solids	0.3	0.3
Oxygen absorbed from permanganate (in 4 hrs. at 27°C)	3.1	3.2
Biochemical oxygen demand (5 days)	0.53	0.68
Anionic detergent	0	0.03

(2). Water collected on 29th September 1959 at 10.30 a.m.

	Kelly Brook, Lustleigh.	
Total hardness (equiv. calcium carbonate)	46.0	p.p.m.
Temporary hardness	22.0	
Permanent hardness	24.0	
Chlorine as chlorides	18.0	
Nitrates as NO_3	14.5	
Sulphates as SO_4	13.0	
Phosphates	0	
Arsenic	0	
Dissolved heavy metals	0	
pH	7.2	